

**WHAT IS CLAIMED IS:**

1. An illumination optical system for  
illuminating a mask using light from a light source,  
5 said illumination optical system comprising a shape  
varying mechanism for continuously making a shape of an  
effective light source variable,

wherein said shape varying mechanism  
includes:

10 a first stop plate that has a first aperture  
part for allowing the light to pass through the first  
aperture part; and

a second stop plate that has second aperture  
part for allowing the light that has passed through the  
15 first stop plate through the second aperture part.

2. An illumination optical system according to  
claim 1, wherein said effective light source has two  
independent areas that decenter from an optical axis of  
20 the light.

3. An illumination optical system according to  
claim 1, wherein said effective light source has four  
independent areas that decenter from an optical axis of  
25 the light.

4. An illumination optical system according to claim 1, wherein the first aperture part is almost equal in shape to the second aperture part.

5 5. An illumination optical system according to claim 1, wherein the first and second aperture parts have one of shapes of a sector, a circle, an ellipse, and a polygon.

10 6. An illumination optical system according to claim 1, further comprising a shape adjusting mechanism for adjusting a shape of the effective light source.

15 7. An illumination optical system according to claim 6, further comprising a detector for detecting a shape of the effective light source at an exit side of said shape adjusting mechanism.

20 8. An illumination optical system according to claim 6, wherein the shape adjusting mechanism includes optics to change a relative ratio of an area of the effective light source.

25 9. An illumination optical system according to claim 8, wherein the optics has a cone or polygonal shape.

10. An illumination optical system according to claim 1, wherein the shape varying mechanism includes at least one cylindrical lens, inserted into and ejected from an optical path of the light at a side of the light source, for adjusting an aspect ratio of the effective light source.

11. An illumination optical system according to claim 10, wherein a direction of a generating line of the cylindrical lens is rotatably adjusted on a surface orthogonal to optical axis of the light of the effective light source.

12. An illumination optical system according to claim 1, wherein said effective light source has a sectional area that decenters from an optical axis of the light.

13. An illumination optical system according to claim 12, wherein said shape varying mechanism varies a shape of the sectoral area in a radial direction continuously.

14. An exposure method comprising the step of illuminating a mask that arranges a contact-hole pattern and an auxiliary pattern smaller than the contact-hole pattern, using an illumination optical

system for illuminating the mask using light from a light source so as to resolve the contact-hole pattern and restrain the auxiliary pattern from resolving,

wherein said illumination optical system  
5 includes a shape varying mechanism for continuously making a shape of an effective light source variable,  
wherein said shape varying mechanism includes:

a first stop plate that has a first aperture  
10 part for allowing the light to pass through the first aperture part; and

a second stop plate that has second aperture part for allowing the light that has passed through the first stop plate through the second aperture part.

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15. An exposure apparatus comprising:

an illumination optical system for illuminating a mask using light from a light source; and

20 a projection optical system for projecting light from said illumination optical system onto an object to be exposed,

wherein said illumination optical system includes a shape varying mechanism for continuously  
25 making a shape of an effective light source variable,  
wherein said shape varying mechanism includes:

a first stop plate that has a first aperture part for allowing the light to pass through the first aperture part; and

a second stop plate that has second aperture  
5 part for allowing the light that has passed through the first stop plate through the second aperture part.

16. A device fabricating method comprising the steps of:

10 exposing an object using an exposure apparatus; and

performing a predetermined process for the object that has been exposed,

wherein the exposure apparatus includes:

15 an illumination optical system for illuminating a mask using light from a light source; and

a projection optical system for projecting light from said illumination optical system onto an  
20 object to be exposed,

wherein said illumination optical system includes a shape varying mechanism for continuously making a shape of an effective light source variable,

wherein said shape varying mechanism  
25 includes:

a first stop plate that has a first aperture part for allowing the light to pass through the first aperture part; and

5 a second stop plate that has second aperture part for allowing the light that has passed through the first stop plate through the second aperture part.